SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 7.—"Observations on the Life-history of Leucocytes. Part II. On the Origin of the Granules." By C. E. **Walker**. Communicated by Prof. C. S. Sherrington, F.R.S.

The granules that are so frequently found in leucocytes generally seem to lie scattered quite irregularly in the cytoplasm of the cells in which they occur. In the bone marrow, however, where the leucocytes containing granules are often extremely numerous, a section of properly preserved material will show that the granules are arranged in a more or less definite manner. The granules in these are, as a rule, oval in shape, and seem to lie in sequence close to each other, so that a line drawn through their long axes would appear as a thread or wire coiled up irregularly in the cytoplasm of the cell. There are many gradations in the regularity of this arrangement of the granules. It varies from a mere suggestion of some of them having been strung together, to a very definite order, and the joining of several end to end. There are again other cells in which a large number of granules join together, forming in places a thick, deeply staining thread, the axis of which is continuous with the axis of the strings of separate granules. From these it is possible to pass by almost insensible gradations to cells where there are no granules, but only a thick thread coiled round the nucleus. From this stage it is again possible to pass to cells where the coiled-up thread occupies a space slightly larger than, or equal to the nucleus, until we arrive at some where it seems to be about the same size in proportion to the nucleus as is the archoplasm in the case of the spermatid. Though it has not been possible as yet to trace the origin of this thread farther, it is strongly suggested that it arises in the archoplasm, which is often seen to be connected with it. During the whole of its existence the thread stains very deeply, and always with the basic in preference to the acid stain. When it has entirely broken up, the granules formed from it still stain in the same manner, but as they begin to lose their regular arrangement so they begin to lose their affinity for the basic stain. These phenomena have only been met with among the cells of the bone marrow. It has been seen that the staining reaction in some at any rate of the granular cells changes from basic to acid; the presence, therefore, of cells containing acidophile and basiphile granules in various proportions is just what one would expect, and is no argument against a common origin of both from the thread here described as occurring in the cells of the bone marrow. The opportunity is taken of pointing out the relationship between the structures which arise from the true archoplasm. Among such structures are the archoplasmic vesicles found in the cells of the testis, which develop into the cephalic cap of the spermatozoon, the similar structures (Plimmer's bodies) which appear in some of the cells in malignant growths, and the granules in leucocytes.

June 27.—"Observations on the Life-history of Leucocytes. Part III." By C. E. **Walker**. Communicated by Prof. J. B. Farmer, F.R.S.

The author in a previous communication described the occurrence of the meiotic phase and of a number of post-meiotic generations among the leucocytes in vertebrate animals. The number of chromosomes in such cells must, if this occurs, be reduced to one-half of that found in the somatic cells. Such leucocytes will, in fact, have passed through that change which appears to be a necessary prelude to conjugation throughout the animal and vegetable kingdoms. The present paper describes certain phenomena as occurring in leucocytes, and claims that these are most probably to be interpreted as a process of conjugation between individual leucocytes that have passed through the meiotic phase. This conjugation is said to be accomplished in a somewhat complicated manner. The nucleus of one leucocyte sends out a process which penetrates the cytoplasm belonging to itself and to that of the partner in conjugation. This process is in the form of a tube, and through it the linin and chromatin of the one nucleus are drawn into that of the other. The absorption of one cell by another is a well-known phenomenon, but is a comparatively simple affair. The absorbed cell is taken into the cytoplasm of the absorbing cell, and is there digested. No nuclear change takes place, and the absorption is apparently carried out in the cytoplasm without the nucleus being directly involved.

It is claimed that the appearance of a special and complex apparatus with no apparent result but the transference of the contents of one nucleus to the other without exposing the contents so transferred to the action of the cytoplasm, shows that some process other than mere absorption of one cell by another is taking place, and that fertilisation is the probable explanation. It is also suggested that this may be a form of fertilisation not hitherto observed in unicellular forms, and that its occurrence among leucocytes is a case of phylogenetic reversion.

Physical Society, October 25.—Prof. J. Perry, F.R.S., president, in the chair.—Magnetic oscillators as radiators in wireless telegraphy: Dr. J. A. **Fleming**. The paper describes experiments made with flat square coils of various sizes used as magnetic oscillators in the quadrangle of University College, London. In one circuit undamped oscillations were set up by means of a Poulsen arc, and the induced oscillations created in the other circuit at a distance were detected and measured by means of the author's oscillation valve or glow-lamp detector. The distance separating the two circuits was varied from about 50 feet to 250 feet. Curves were obtained showing how the secondary current varied with the distance of the circuits apart and with their relative position. It was shown that the inductive effect was greatest when the flat coils were in a horizontal position and at a certain distance above the earth. The law of variation with distance proved to be something between the inverse cube and the inverse square of the distance. It was then shown that increase in size of the coils had a very marked action in increasing the inductive effect, and also that for equal power the use of the spark method, creating intermittent oscillations in the primary, gave better effects than the use of the arc or undamped oscillations. It was also shown that for the coils used the true radiation of energy was very small, and therefore that the distance effects obtained were almost entirely due to magnetic or Faradaic induction. Suggestions were then made for increasing the efficacy of the ordinary inductive type of wireless telegraphy by the use of high-frequency oscillations in the primary circuit, and a suitable detector such as the author's oscillation valve combined with a telephone as a receiver in the secondary circuit. Such a method would have a far greater reach than the ordinary low-frequency alternating current inductive telegraphy, and not be open to the objection of disturbing commercial telephonic circuits.—The use of variable mutual inductances: A. **Campbell**. In connection with wireless telegraphy, the measurement of small inductances and capacities is of importance; one of the methods described has special reference to small self-inductances. Mutual inductances can be more easily dealt with than self-inductances, for the former can be (1) more accurately calculated from dimensions; (2) are less affected by change of frequency; and (3) when variable can be made to pass through zero value. A convenient form of variable mutual inductance consists of a continuously variable part and a series of steps. The first consists of two equal parallel coils with a third coil moving parallel to their planes round an axis eccentric to the fixed coils. The scale thus obtained is very open near zero (which is an advantage), and the graduation is done by experiment, a theoretical discussion being given in an appendix. The steps are obtained by means of another fixed coil of stranded wire, each strand giving an equal subdivision. The model shown had two ranges, from 0·01 up to 200 and 2000 microhenries.

Entomological Society, November 6.—Mr. E. Saunders, F.R.S., vice-president, in the chair.—*Exhibits*.—A. H. **Jones**: A specimen of the longicorn beetle *Acanthocinus aedilis*, L., a Rannoch species, found in Gray's Inn Road.—Dr. F. A. **Dixey**: ♂ and ♀ specimens of a new Pinacopteryx, discovered by Mr. S. A. Neave in northern Rhodesia. The ♀ resembled that of *P. rubrobasalis*, but the ♂ was quite distinct. Both sexes of *P. rubrobasalis* and the female sex of Mr. Neave's species were mimics

of *Mylothris agathina*.—W. G. **Sheldon**: A series of *Limenitis populi* and ab. *tremulae* with intermediate forms taken this year near Laon, and a series of *Chrysophanus hippothoë* from the same region, the females displaying a wide range of variation for so restricted a locality as that in which they were captured.—G. C. **Champion**: A fully developed example of *Mesovelia furcata*, M. and R., from Slapton, south Devon, and *Thamnotrizon cinereus* from Lynmouth, north Devon.—A. **Harrison** and Hugh **Main**: A case of *Aplecta nebulosa*, arranged to show the great range of variation of this species in Delamere Forest, with series from Epping Forest, north Cornwall, and the New Forest for comparison.—R. S. **Mitford**: (1) Two ♂ specimens of *Cryptocephalus bipunctatus*, taken by him at Niton, in the Isle of Wight, in July, these being two forms of varieties well known on the Continent, but hitherto found in Britain; (2) *Paracymus aeneus*, captured on the north Essex coast in June, 1898, thus establishing the claim of *P. aeneus* to be regarded as a British beetle; (3) an example of the very rare *Lathrobium rufipenne*, taken at Niton, Isle of Wight, in July, 1906, a specimen of the rare *Ceuthorrhynchus viduatus*, taken by him at Brading, Isle of Wight, in July, 1907, and a specimen of *Cis dentatus*, taken at Sandown, Isle of Wight, in July, 1906; this species, although well known on the Continent, had never before been recorded in Britain.—*Papers*.—A large series of Nycteribiidæ (parasitic Diptera) from Ceylon: J. E. **Collin**.—(1) Some butterflies taken in Jamaica; (2) some butterflies of Tobago: Dr. G. B. **Longstaff**.

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (physico-mathematical section) contains the following memoirs communicated to the society:—

March 9.—The uniformisation of real algebraic curves: P. **Koebe**.

May 11.—The uniformisation of given analytic curves: P. **Koebe**.—The radio-activity of the air over the open sea: C. **Runge**.—Researches from the Göttingen University chemical laboratory, xvii.:—(1) on oxygenated derivatives of sylvestrene; (2) on nopinone; (3) on the synthesis of higher homologues of terpin and of higher homologous terpenes: O. **Wallach**.—Contribution to the theory of undamped electric oscillations in gas discharges: E. **Riecke**.—Numerical survey of the near and remote earthquakes registered at the Samoa Observatory during 1906: F. **Linke**.

July 6.—The effect of light upon the formation of sulphuric acid: A. **Coehn**.—The class enumeration of the *Körper* of complex multiplication: R. **Fueter**.

July 7.—The boundary values in the case of the differential equation $\Delta\Delta U = 0$: A. **Haar**.

DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 21.

ROYAL SOCIETY, at 4.30.—Results of the Interaction of Mercury with Alloys of Other Metals: Dr. J. W. Mallet, F.R.S.—Note on the Sensibility of the Ear to the Direction of Explosive Sounds: A. Mallock, F.R.S.—On the Silver Voltameter: Part i., A Comparison of Various Forms of Silver Voltameters: F. E. Smith; and a Determination of the Electrochemical Equivalent of Silver: F. E. Smith and T. Mather, F.R.S.; Part ii., The Chemistry of the Silver Voltameter: F. E. Smith and Dr. T. M. Lowry.—On the Normal Weston Cadmium Cell: F. E. Smith.—On a Method of Depositing Copper upon Glass from Aqueous Solutions in a Thin Brilliantly Reflecting Film, and thus Producing a Copper Mirror: Dr. F. D. Chattaway, F.R.S.—On Luminous Efficiency and the Mechanical Equivalent of Light: Dr. C. V. Drysdale.—The Dispersion of Double Refraction in Relation to Crystal Structure: Dr. T. H. Havelock.

CHEMICAL SOCIETY, at 8.30.—The Interaction of Metallic Sulphates and Caustic Alkalies: S. P. U. Pickering.—The Chemistry of Bordeaux Mixture: S. P. U. Pickering.—Aromatic Azoimides, Part iii., The Naphthylazoimides and their Nitro-derivatives: M. O. Forster and H. E. Fierz.—Studies of Dynamic Isomerism. Note on the Action of Carbonyl Chloride as an Agent for Arresting Isomeric Change: T. M. Lowry and E. H. Magson.—Emulsions: S. P. U. Pickering.—The Electrometric Measurement of the Hydrolysis of the Salts of Anilinium, Ammonium, Aluminium, Chromium, Thallium, Zinc, Magnesium, Cerium, Thorium, Nickel and Cobalt: H. G. Denham.

INSTITUTION OF MINING AND METALLURGY, at 8.

LINNEAN SOCIETY, at 8.—Abnormal Structures in Leaves, and their Value for Morphology: W. C. Worsdell.—Specimen-preservation in Australian Museums: J. G. Otto Tepper.—Revision of the Genus Illigera, Blume: S. T. Dunn.—*Exhibits*:—Luminous Larva from British Guiana: C. W. Anderson.—Living Specimens of Peripatus, from South Africa: Prof. A. Dendy.—*Linaria arenaria*, and other British Plants: G. C. Druce.

FRIDAY, NOVEMBER 22.

PHYSICAL SOCIETY, at 5.—On Singing Sand from New England: S. Skinner.—Exhibition of a Micromanometer: L. Bairstow.—A Diabolo Experiment: Vernon Boys.—Exhibition of a Gyroscope illustrating Brennan's Monorailway: Prof. H. A. Wilson.

MONDAY, NOVEMBER 25.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Exploration of the Nun-Kun Mountain Group and its Glaciers: Dr. W. Hunter Workman.

SOCIOLOGICAL SOCIETY, at 8.—The Psychological Origin of Religion: Prof. J. H. Leuba.

SOCIETY OF ARTS, at 8.—The Theory of the Microscope: Conrad Beck.

INSTITUTE OF ACTUARIES, at 5.—On the Valuation of Staff Pension Funds, Part ii., Widows' and Children's Pensions (continued): H. W. Manly, with Tables by W. A. Workman.—A Pension Fund Problem; with some Remarks on the Deduction of Salary-scales: J. Bacon.

TUESDAY, NOVEMBER 26.

ZOOLOGICAL SOCIETY, at 8.30.—On some New and Little-known Araneidea: Rev. O. Pickard-Cambridge, F.R.S.—Descriptions of New Species of South-American Cryptocephalini; M. Jacoby.—A Monograph of the Chiropteran Genera Uroderma, Enchisthenes, and Artibeus: Dr. K. Andersen.—Environmental Studies on the Limpet: E. S. Russell.—Contributions to the Knowledge of the Anatomy of the Batrachian Family Pelobatidæ: F. E. Beddard, F.R.S.—On the Microlepidoptera of Teneriffe: Lord Walsingham, F.R.S.—Dates of Publication of the Separate Parts of Gmelin's Edition (thirteenth) of the "Systema Naturæ" of Linnæus: J. Hopkinson.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Tranmere Bay Development Works: S. H. Ellis.

WEDNESDAY, NOVEMBER 27.

BRITISH ASTRONOMICAL ASSOCIATION, at 5.—Address by Sir David Gill, K.C.B., F.R.S.

SOCIETY OF ARTS, at 8.—The Franco-British Exhibition, 1908: Sir John A. Cockburn, K.C.M.G.

THURSDAY, NOVEMBER 28.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Development of Turbo-Generators: Dr. Robert Pohl.

FRIDAY, NOVEMBER 29

SOCIETY OF ARTS, at 8.—The Hygiene of Work in Compressed Air (Diving, Caisson Work, Sub-aqueous Tunnelling, &c.): Dr. J. S. Haldane, F.R.S.

CONTENTS.